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PLEIADES SYSTEM ARCHITECTURE AND MAIN PERFORMANCES

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Abstract. France, under the leadership of the French Space Agency (CNES), has set up a cooperative program with Austria, Belgium, Spain, Sweden, in order to develop a space Earth Observation system called PLEIADES.

PLEIADES is a dual system, this means that it is intended to fulfill an extended panel of both civilian and Defense user' s needs..

This paper reports the status of the satellite after its launch and the in orbit commissioning, the PLEIADES satellite first model has been launched at the end of year 2011, the second model will be launched about 12 months later. It describes the main mission characteristics and performances status. It exposes how the system, satellite and ground segment have been designed in order to be compliant with a dual exploitation between civilian and defense partners.

The system is based on the use of a set of newly European developed technologies to feature the satellite. In order to maximize the agility of the satellite, weight and inertia have been reduced using a compact hexagonal shape for the satellite bus. The optical mission consists in Earth optical observation composed of 0.7 m nadir resolution for the panchromatic band and 2.8 m nadir resolution for the four multi-spectral bands. The image swath is about 20 km.

PLEIADES delivers optical high resolution products consisting in a Panchromatic image, into which is merged a four multispectral bands image, orthorectified on a Digital Terrain Model (DTM).

Thanks to the huge satellite agility obtained with control momentum gyros as actuators, the optical system delivers as well instantaneous stereo images, under different stereoscopic conditions and mosaic images, issued from along the track thus enlarging the field of view.

The ground segment is composed of a dual ground center located in CNES Toulouse premises in charge of preparing the dual mission command plan and of the real time contacts with the satellite through a control center. The dual ground center interfaces with several mission centers : one center is built for each Defense partner (France, Spain ...), one center is set up for the Civilian Operator. Each mission center is in charge of managing the programming requests, then,

receiving the mission telemetry, processing the data to feed a catalog and an archive, to generate the system products and distribute them to the final user.

System reactivity has been optimized with a chronology based on three mission planning activations per day. The mission plan is uploaded to the satellite just before flyby over East Asia , Europe and North America. In addition a Direct Tasking mode is available for commercial Image Receiving Stations.

[Conference Paper](#) (PDF, 1157 KB)

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